

LESSON 2: LED CHASER

INTRODUCTION:

Dice, which all of us are normally will use it when playing a games especially monopoly. But have we ever head of LED dice? LED dice, one of the interesting project using LED except from LED blinking. In here, we going to experience on how to make an LED dice with a few LEDs interface with Arduino Uno.

COMPONENTS:

- 1x Breadboard
- Jumper wire
- 6x LEDs
- 6x 330Ω Resistor
- 1x 10k Pontentiometer

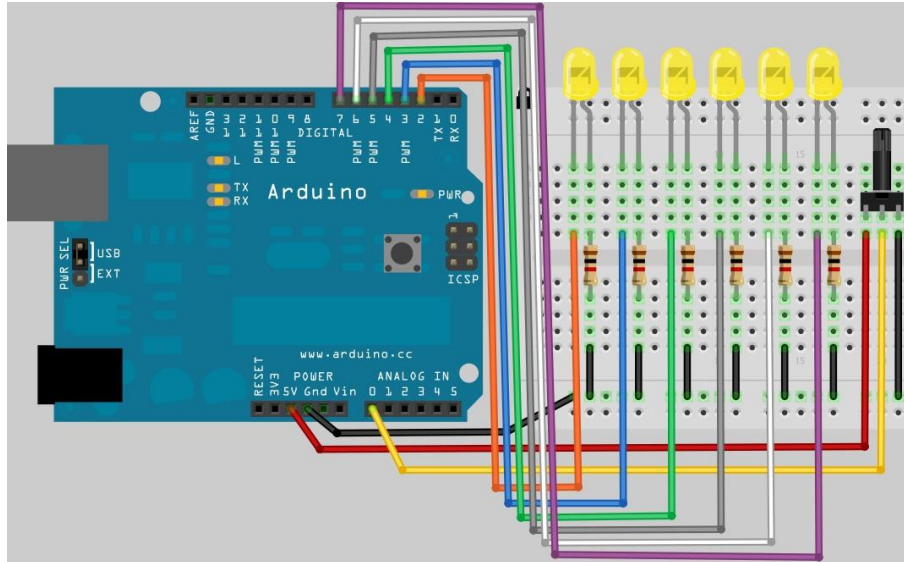
PRINCIPLE

This is a LED Chaser, with the simplest code. This is an amazing LED chaser that contain 6 LEDs. Each LED must protect by a 330ohm resistor. Here you vary the speed of chasing LEDs by potentiometer which is as analog input to arduino. You can have different LED glowing arrangements, like Knight Rider is kinda famous, you can make it by simply putting the same loop but with descending outputs.

The potentiometer has three pins, the centre one is connected to the analog input of arduino and rest of two pins are GND and Vcc.

CONNECTION

STEP 1: Referring to the figure below, there are total 6 LEDs which is anode are connected to digital port (2,3,4,5,6,7). While, other end are connected to 330Ω resistor and to ground GND. Next, connect the potentiometer which one end RED wire to VDD(5V), the other end BLACK wire connected to ground GND while the middle pin YELLOW wire is connect to analog input A0.



STEP 2: Program

```
// Author      : CYTRON TECHNOLOGIES SDN BHD
// Project     : Arduino Duemilanove
// Project description : Project_3: LED Chaser (delay control using potentialmeter)
```

```
//LEDs
```

```
byte pinLeds[] = {2,3,4,5,6,7};
```

```
//delay period initialise
```

```
unsigned int delay_period = 0;
```

```
//Analog Pin
```

```
int analogPin = A0;
```

```
unsigned int currentLED = 0;
```

```
int direction = 1;
```

```

/*****
*****

```

```
* PRIVATE FUNCTION: setup()
```

```
*
```

```
* PARAMETERS:
```

```
* ~ void
```

```
*
```

```
* RETURN:
```

```

* ~ void
*
* DESCRIPTIONS:
* Define of I/O pin as Input or Output
*
*****
*****/
// The setup() method runs once, when the sketch starts
void setup ()
{
  unsigned char x;
  for (x=0 ; x<6 ; x++)
  {
    pinMode(pinLeds[x],OUTPUT);    // Define pinLeds[0] to pinLeds[5] are output
  }
}

/*****
**
* PRIVATE FUNCTION: loop()
*
* PARAMETERS:
* ~ void
*
* RETURN:
* ~ void
*
* DESCRIPTIONS:
* Non-Stop looping
*
*****
*/
void loop()
{
  delay_period = analogRead(analogPin);

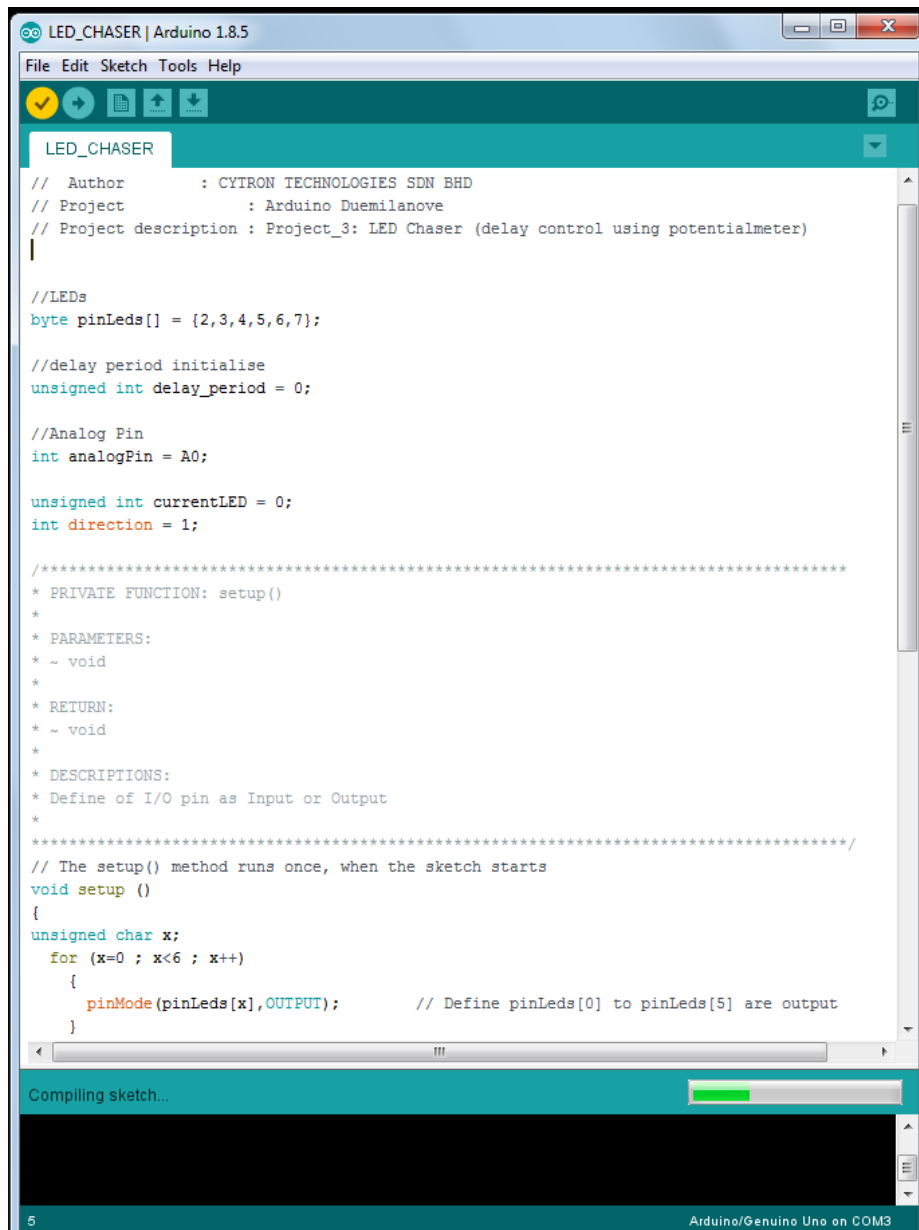
  // turn on the current LED
  digitalWrite(pinLeds[currentLED], HIGH);
  delay(delay_period);          // delay_period refer to ADC value
  digitalWrite (pinLeds[currentLED], LOW);

  // increment by the direction value
  currentLED += direction;

```

```
// change direction if we reach the end
if (currentLED == 5) {direction = -1;}
if (currentLED == 0) {direction = 1;}
}
```

STEP 3: Compile the code



The screenshot shows the Arduino IDE interface for a sketch named "LED_CHASER". The code is displayed in the main editor area, and a progress bar at the bottom indicates that the sketch is being compiled. The code includes comments about the author (CYTRON TECHNOLOGIES SDN BHD), project name (Arduino Duemilanove), and project description (Project_3: LED Chaser). It defines an array of LED pins, initializes a delay period, and sets an analog pin. The setup function is defined to initialize the LED pins as outputs.

```
LED_CHASER
// Author      : CYTRON TECHNOLOGIES SDN BHD
// Project     : Arduino Duemilanove
// Project description : Project_3: LED Chaser (delay control using potentiometer)

//LEDs
byte pinLeds[] = {2,3,4,5,6,7};

//delay period initialise
unsigned int delay_period = 0;

//Analog Pin
int analogPin = A0;

unsigned int currentLED = 0;
int direction = 1;

/*****
 * PRIVATE FUNCTION: setup()
 *
 * PARAMETERS:
 * ~ void
 *
 * RETURN:
 * ~ void
 *
 * DESCRIPTIONS:
 * Define of I/O pin as Input or Output
 *****/
// The setup() method runs once, when the sketch starts
void setup ()
{
  unsigned char x;
  for (x=0 ; x<6 ; x++)
  {
    pinMode(pinLeds[x],OUTPUT);    // Define pinLeds[0] to pinLeds[5] are output
  }
}
```

Compiling sketch...

5 Arduino/Genuino Uno on COM3

STEP 4: Upload the sketch to the Arduino Uno board.



```
LED_CHASER | Arduino 1.8.5
File Edit Sketch Tools Help
LED_CHASER
// Author      : CYTRON TECHNOLOGIES SDN BHD
// Project     : Arduino Duemilanove
// Project description : Project_3: LED Chaser (delay control using potentiometer)
|
//LEDS
byte pinLeds[] = {2,3,4,5,6,7};
//delay period initialise
unsigned int delay_period = 0;
//Analog Pin
int analogPin = A0;
unsigned int currentLED = 0;
int direction = 1;
/*****
* PRIVATE FUNCTION: setup()
*
* PARAMETERS:
* ~ void
*
* RETURN:
* ~ void
*
* DESCRIPTIONS:
* Define of I/O pin as Input or Output
*
*****/
// The setup() method runs once, when the sketch starts
void setup ()
{
  unsigned char x;
  for (x=0 ; x<6 ; x++)
  {
    pinMode(pinLeds[x],OUTPUT);    // Define pinLeds[0] to pinLeds[5] are output
  }
}
Uploading...
Sketch uses 1078 bytes (3%) of program storage space. Maximum is 32256 bytes.
Global variables use 21 bytes (1%) of dynamic memory, leaving 2027 bytes for local variables.
5 Arduino/Genuino Uno on COM3
```

ADDITIONAL INFORMATION



POTENTIOMETER BASICS

A potentiometer is a type of variable resistor, made so that it can be easily adjusted. A resistor is an electronic component whose function is to resist the flow of electricity. The more resistance, the slower the electric current flows. Because a potentiometer allows a user to adjust the resistance, it can be used to adjust a circuit while it is running.

POTENTIOMETER STRUCTURE

A potentiometer has three contacts – two fixed contacts on either end and a movable one called a wiper. As the wiper moves closer to one fixed contact, it moves further away from the other, decreasing the resistance with the closer one and increasing it with the further one. Some potentiometers, called rheostats only have two contacts – a fixed one and a wiper. In both cases, the position of the wiper is usually adjusted by turning a knob or moving a slider.